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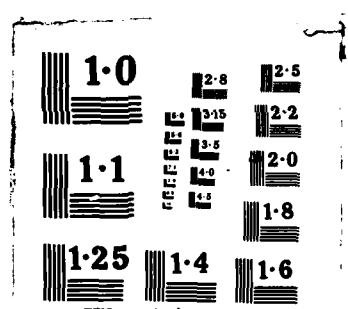
PROJECT COMPLETION REPORT FOR YOKOSUKA DEGAUSSING RANGE 1/1
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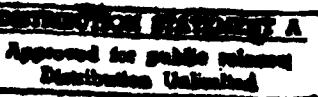
PROJECT COMPLETION REPORT
FOR
YOKOSUKA DEGAUSSING RANGE
U. S. FLEET ACTIVITIES

YOKOSUKA,

JAPAN

BY

BESIER, GIBBLE & QUIRIN
CONSULTING ENGINEERS



FPO - I - 80 [17]

DECEMBER 1980

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CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D.C. 20374

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The concept of using jettied fiberglass reinforced plastic tubes which would
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EXECUTIVE SUMMARY

The concept of using jetted fiberglass reinforced plastic tubes which would house deep and medium range magnetometers of the degaussing range at Yokosuka, Japan, was adopted after the jetting and proofloading of test tubes proved satisfactory and more economical than the initial concept using driven wooden piles in combination with the plastic tubes.

The new degaussing range which was to have the same base line bearing and location as the existing range was moved two feet south in an effort to avoid existing range piles and to facilitate the jetting operation of the tubes in relatively murky water.

The new degaussing range has 20 medium range coils (-60 feet from mean low water level) spaced at 20' and 10 deep range coils (-80 feet from M.L.W.L.) spaced at 30' all housed in $6\frac{7}{8}$ ⁱⁿ diameter green thread fiberglass reinforced plastic tubes. Three different tube pile lengths were used each one requiring a single splice of two tubes as shipped to the site. Additional preparation of the tubes consisted of inserting wooden jetting tips.

The magnetometer coil electrical cables run from each coil along the sea floor, through an embedded concrete trough for the last 100 feet to shore, and are bundled in a 12 inch diameter PVC pipe as they continue through the existing steel bulkhead to the range house.

The tube piles were jetted into the sea floor and later in-

pected for compliance with specified tolerances. The tubes did fall within the allowable tolerances for locations and inclination. This information is recorded on the as-built drawing and in the figures and appendices of the completion report. ←

Actual completion of all work was slightly ahead of the planned schedule.

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REFERENCES

1. Yokosuka Degaussing Range - Project File
2. NAVFAC Dwg. No. 3024899 Degaussing Range Plan and Profile
3. NAVFAC Dwg. No. 3024900 Degaussing Range Installation Details
4. OICC Far East Specification No. 42-80-0277 by C. Chern
5. Contractor's Sketches (in Japanese)
6. As Built Record Drawing - Besier Gibble & Quirin

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DRAWING

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1. NAVFAC As-Built Drawing No. 3024899

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1.0 Introduction

This completion report is concerned with the reconstruction of the degaussing range components of the Yokosuka Degaussing Range Replacement Project, Yokosuka, Japan. See NAVFAC Drawing No. 3024899.

The degaussing range is comprised of 30 magnetometers, 10 deep range and 20 medium range, spaced symmetrically about the center of the range with 30' and 20' centers respectively. The deep range magnetometers are vertically located at 80' below mean low water level. The medium range magnetometers are vertically located at 60' below mean low water level. The magnetometers are housed in fiberglass reinforced plastic tubes embedded in the sea floor. The magnetometer cables are run to the top of their tubes, down the exterior to the sea floor and then run along the sea floor to the range house. Each cable is tied to the exterior of its fiberglass tube and is weighted to the sea floor by lead sheets. Prior to passing thru a penetration in the steel bulkhead adjacent to the existing range house, 100' of the cable length is laid in an embedded covered concrete trough.

The degaussing range base line is N86° 00'00"W from true north and is 2 feet south of the benchmark (station 1 +00) which is located on the shore steel bulkhead. The mid-point of the range line is 657'-6" west of this benchmark. The overall length of the range is 380' (19 spaces at 20'). See Figure 1 and drawing No. 3024899.

On September 8, 1980 the degaussing range was formally accepted
and to date is operating satisfactorily.

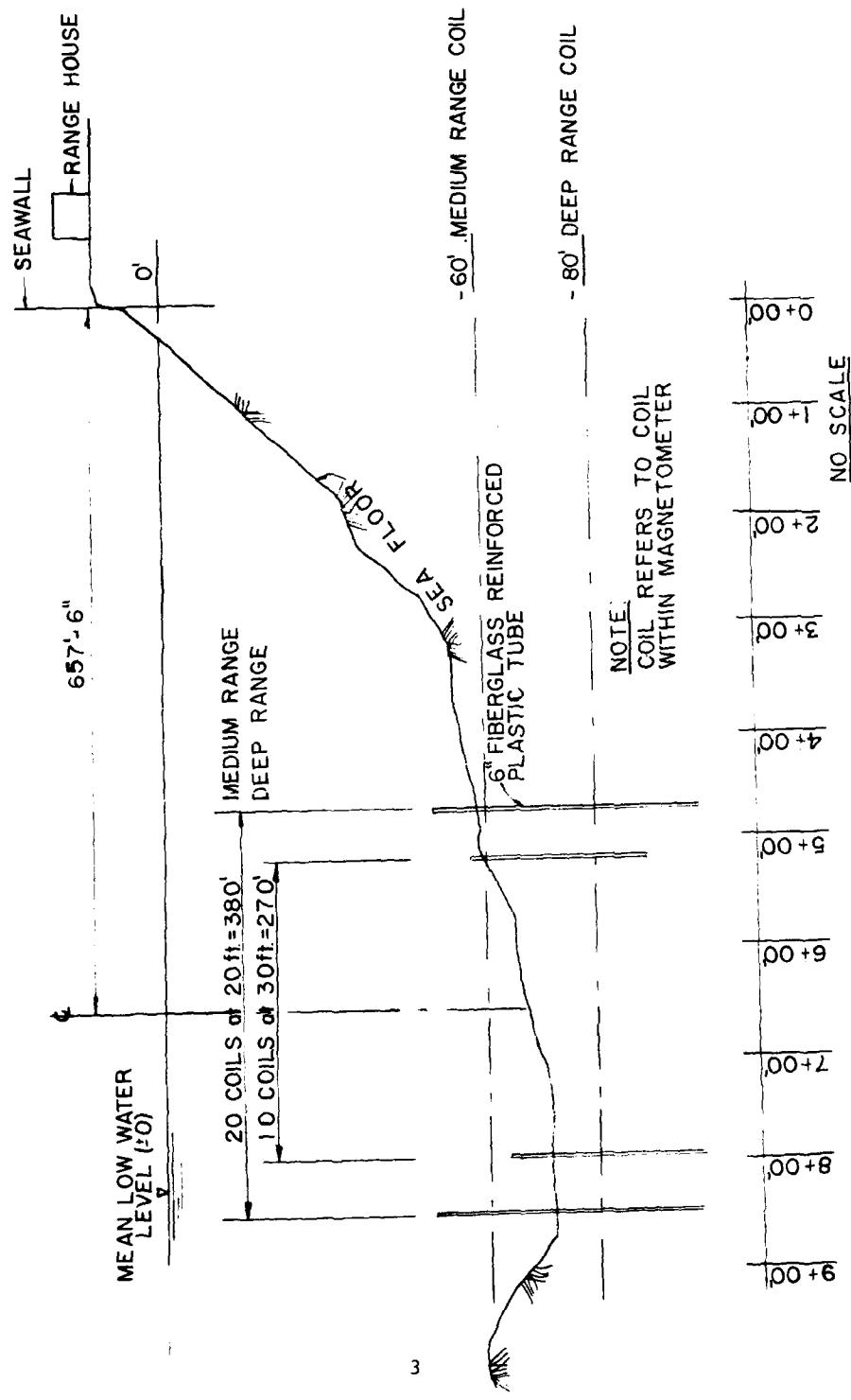


Figure 1 - Profile of Range

2.0 Overview-History

2.1 History

In the early 1960's, the degaussing range currently being replaced was constructed at the U.S. Naval Base situated in Yokosuka, Japan. The project included the installation of wood piles with plastic instrumentation tubes, magnetometers and cables running to a newly built range house on shore. The range consisted of 20 magnetometers spaced at 15 feet. The base line of the range passed through the existing benchmark, station 0+00, in the direction N86°00'00"W from true north.

A design for the replacement of the existing range started sometime in the mid-late 1970's. Due to unexpected damage to the existing degaussing range, commencement of work on the range replacement project was set for May 1, 1980.

2.2 Initial Design

The task of designing the replacement range was performed by the Chesapeake Division, Naval Facilities Engineering Command. The initial design proposed installation of timber piles which either carried the magnetometer probes directly or stabilized a plastic encasement tube housing the magnetometer probes. The deep range magnetometers and the three medium range magnetometers closest to shore would be housed in 6"Ø plastic tubes jetted into the seafloor adjacent to the timber piles and tied to the timber piles at the top. The seventeen remaining medium range magnetometers were to be fastened directly to the tops of the timber piles. The piles were to be wrapped with a PVC barrier for protection against

marine borers. The cables were to be buried in a trough in the nearshore landing area for protection against movement due to wave action. The existing degaussing range was to be removed.

2.3 Wood Pile Replacement by Jetted Fiberglass Reinforced Plastic Tubes

During the summer of 1979 the Underwater Construction Team TWO (UCT-2) successfully jetted two fiberglass tubes into the sea floor, one at each end of the present range. The tubes were proof loaded and stayed in place. It was decided to eliminate the wood piles from the project and use embedded fiberglass tubes to house the magnetometers exclusively. This alternative also eliminated the need for protecting the wood piles from marine borers. Contract documents and specifications (see Appendix C) were revised to reflect these changes.

3.0 Summary of Design

3.1 Degaussing Range Design

Type II degaussing range by U.S. Naval Station, San Diego, Degaussing Department.

3.2 Fiberglass Reinforced Tube Piles

3.2.1 Flexural Design

Bending stresses in the tube piles is a function of its projection above the sea floor, the intensity of the forces produced by waves and their frequency. The average projection above the sea floor for the medium range magnetometer tubes is about 12 feet. The design current is assumed to be 1 knot with an average period of five seconds. The analysis shows that this loading condition will produce maximum bending stresses in the tube of about 250 pounds per square inch. The tube will have been subjected to roughly 130×10^6 cycles of loading over its 20 years design life span.

The proposed green thread fiberglass reinforced plastic tube has the following engineering properties at 75 degrees Fahrenheit:

Beam bending ultimate stress = 23,000 pounds per square inch

Hydrostatic burst ultimate hoop stress = 46,300 pounds per square inch

Hydrostatic design cyclic hoop stress = 6,000 pounds per square inch (for 130×10^6 cycles)

To determine the ultimate bending stress under this cyclical (fatigue) type loading, the ultimate stress was "factored down" by the ratio of stresses for the hydrostatic test case:

Ultimate Cyclic Beam Bending Stress
= $23000 \times 6000/46300$
= 2980 pounds per square inch (for 130×10^6) cycles @ 75 degrees
Fahrenheit)

This represents the stress range which will cause the tube to fail in bending after being subjected to the specified number of loading cycles due to the wave action. The actual stress range felt by the tubes (symmetrical stress reversal) will be double that produced by a "one sided" loading condition. This range is therefore 500 pounds per square inch (2×250).

The factor of safety (F.O.S.) of the instrument tube against bending failure over its 20 years life span is:

$$\text{F.O.S.} = \frac{2980}{500} \approx 6$$

which is satisfactory to design.

The maximum lateral deflection at the top of the tube under wave action is 0.40 inches.

3.2.2 Embedment Design

It was necessary to determine whether the minimum embedment length of the tubes into the seafloor was adequate to secure them in a fixed vertical location. The net uplift force was calculated to be 195 pounds for an embedment length of 22 feet. To maintain pure force equilibrium this would require an average surface friction between the soil and tube wall of 5 pounds per square foot. It was determined that for cohesionless soil and weak normally consolidated cohesive soils with $c=0$ and $\theta = 20^\circ$, the tube would remain

in place. Therefore the 22 feet minimum embedment length of the tubes as anticipated by the designers was sufficient to secure the tubes in a fixed vertical location. It was noted that proof loading of the tubes (pull out type) should be performed only after the soil had been allowed to fill in any voids created by the jetting action used to install them.

3.3 Cable Sinkers

The magnetometer cables were to be bound and weighted at ten feet intervals with polyethylene sheets and lead sheets. At each of the bindings at ten feet intervals the cables would be wrapped with 3 turns of a 3 millimeter thick polyethylene sheet and then covered with a lead sheet at the rate of one pound per cable per ten feet. Each of the bindings were then secured with 2 individual coils of 3/8" diameter manilla rope. See reference 3.

3.4 Site Conditions

The sea bottom profile assumed for design purposes is as follows:

- a) water depth (below mean low water level) at west end of range of 70 feet
- b) water depth at east end of range of 60 feet
- c) water depth at 30 feet from on shore steel bulkhead of 0 feet.

Existing wood piles were to be cut and removed to a minimum depth of 1 foot below the mudline.

A concrete pier encasing a 12" diameter PVC pipe which houses the cables as they pass through the steel sheet piling would be

tight to the sheet piling with field welded rebar attachments at seven locations. A hole was to be cut in the steel bulkhead in the vicinity of the PVC pipe penetration and reinforced with 3/4" thick steel plate.

On shore the cables would pass through existing buried pipe to the range house.

4.0 Planning and Scheduling Summary

4.1 Constraints

The area of the bay in which work was to be done is a traffic lane for ships. Jetting of the piles and diver related activities would have to be interrupted to allow for these ship movements.

The cable trough installation was to be performed under dewatered conditions.

4.2 Installation Plan

The contractors plan is not available.

Fiberglass tube jetting operation is described in directive to UCT-2 to jet test piles by C. Chern, June 29, 1970. However, this was not used by the contractor. See reference No. 1. See photographs and section 5.4 of this report for a description of the jetting procedure used during this project.

4.3 Scheduling

A proposed project schedule for the degaussing range replacement was submitted by C. Chern, dated December 18, 1979. See figure 2.

At the request of C. Chern, a review of the contractor's record of the work performed to install the tubes was submitted. See appendix A. Otherwise, no initial project schedule describing all phases of the work was submitted by the contractor.

PROJECT SCHEDULE

DEGAUSSING RANGE REPLACEMENT

Yokosuka Japan 12/18/79

1880 SURA JAPAN

Figure 2 - Project Schedule

5.0 Construction/Installation

5.1 Project Contracting

The degaussing range replacement project was competitively bid among local Japanese contractors. At one time, the use of UCT-2 to perform the underwater electrical work was investigated. Prior to bidding the job, this alternative was ruled out due to higher priority work which UCT-2 would be engaged in at the time of construction. Therefore the entire completion of the project was to be the scope of the local contractor's work. UCT-2 was retained as a testing agency for the in-place inspection of the instrument tubes. The contract bid price was \$159,814 payable in Japanese yen for the lowest and successful bidder.

5.2 Relocation of Range Line

The original contract specifications required the removal of existing wood piles and plastic tubes. In a few instances the existing pile and tube would interfere with the positioning of a new fiberglass tube. It was decided to move the range line 2 feet south of the existing range line, while maintaining the same bearing. This change was approved by Naval Sea Systems Command, Magnetic Silencing Facility Director, F. Gregoire.

In addition, the murkiness of the water made it quite difficult to locate the new tubes. It was decided to leave a 1 foot projection above the mud line for 10 of the existing wood piles. This established the bearing line of the old range and was used for reference when positioning the new piles. The remainder of

the existing piles were to be cut one foot below the mudline as called for in the specifications. Since this proved very difficult to do and the new range line having already been moved, it was decided to cut these piles at a point where barnacle growth could easily be removed.

5.3 Tube Pile Preparation

The fiberglass piles furnished by the Government came in 20 feet lengths. The shortest length pile needed for the project was 9 meters (29.5 feet). Therefore, all 30 piles required the splicing of two sections of tube. This was done by means of field applied adhesives to both the bell and spigot ends of the adjoined tubes. See photograph No. 1.

Each assembled pile received a wooden jetting point, wedged into the bevel end of the pile. The tip of the point has a hole bored through it which allows the jet stream of water to pass during the jetting operation. See photographs No. 2 and 3.

5.4 Jetting

This operation went very smoothly, the contractor installing roughly 3 tubes per day. Typically, the top of the tube is attached to a steel pipe (same nominal diameter) into which the water is first pumped. This assembly is bolted to a larger steel pipe which moves vertically in a pile barge mounted driving rig. Once the jetting pump is started, the large pipe serves to weigh down and guide the fiberglass pile as it is being jetted into the sea floor. See photographs No. 4 through 9 and 11 and 12. Divers

positioned the fiberglass tubes at the sea floor before jetting.

5.5 Other Work

Items of work not explicitly covered in the field reports of the Resident Officer in Charge of Construction (ROICC) were: cable laying, concrete trough installation, magnetometer probe installation, hook up to range house and all on shore work. Apparently these items were completed with little or no trouble such that the entire project was turned over ahead of schedule. Although the cable binders details were omitted from the specifications, the range people requested and subsequently received the addition of lead weights to each individual cable.

6.0 Instrument Tube Inspection

6.1 Specified Tolerances

The specified tolerances for the location and inclination of the fiberglass tubes is as follows:

- a) The top of the tube shall be located in plan within an allowable offset circle of maximum radius of 30 centimeter (cm) for the medium range tubes and 45 cm for the deep range tubes. The center of the offset circle corresponds to the indicated idealized location of the tube as shown on the drawings.
- b) All tubes shall be installed vertically within a tolerance of 3 degrees. See figure 3.

6.2 Field Inspection of Instrument Tube Installation

The contractor performed a formal survey of the instrumentation tubes and reported this data. See figure 4, and photograph No. 10. UCT-2 also performed an inclination check on 6 of the tubes. See Appendix B. Based upon the level of tube top given in Figure 4, third column from left, the mark numbers given in the second column from left should be inverted, i.e., M20 is actually M1, M19 is actually M2, D10 is actually D1, etc.

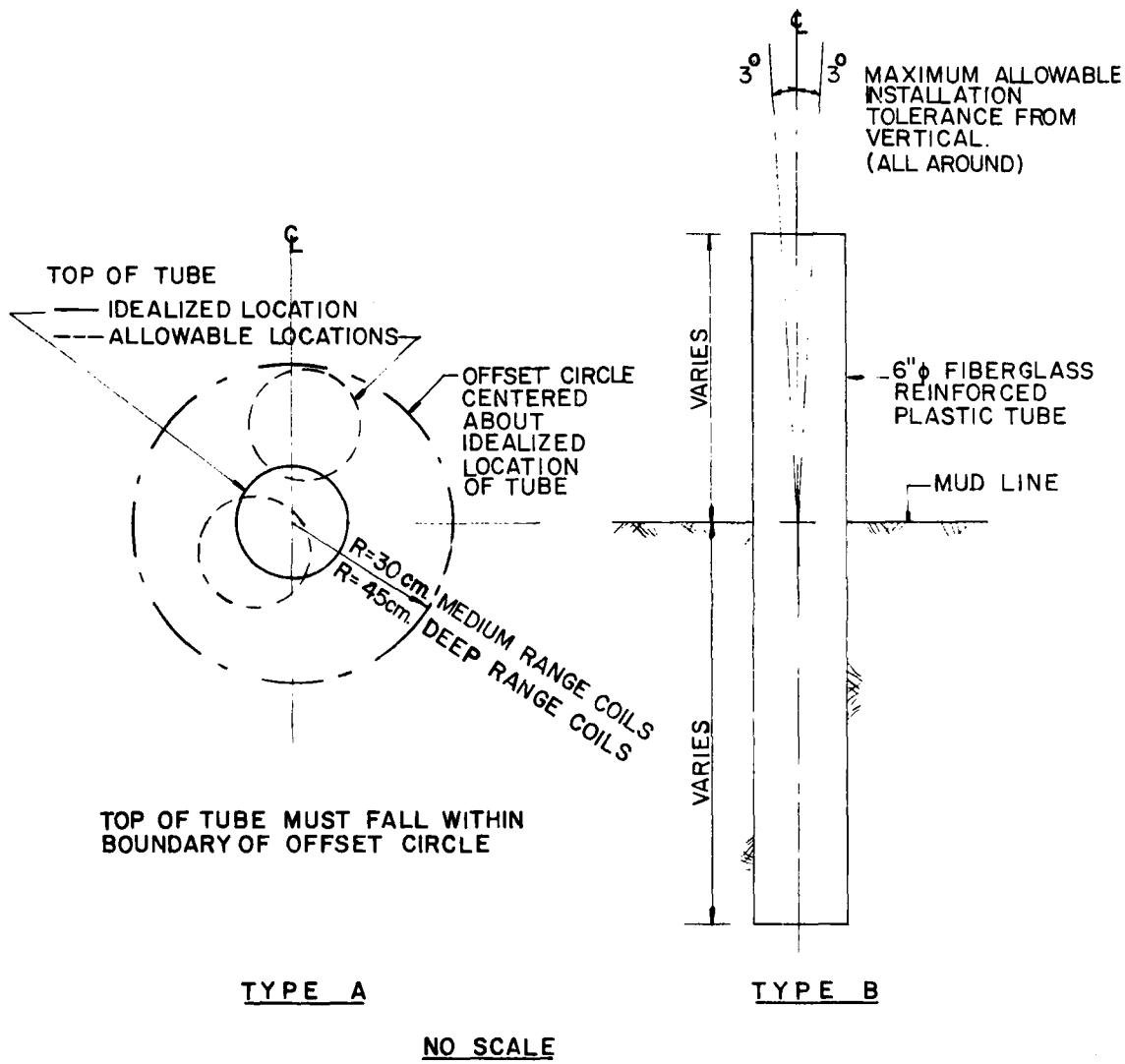


Figure 3 - Installation Tolerances

Figure 4 - Contractor's Survey

Profile of Final Tube Installation						
10	11	Level of Tube-top	Gradient of Tube	Tolerance on Normal Line	Intervals of all tube	Intervals of M-Range tubes
				SOUTH	NORTH	D-Range tubes
1	M 20	(-50' - 0")	(S) 0.5°	0	19' - 8 1/5"	19' - 8 1/5"
2	M 19	(-50' - 0")	(E) 1.5	2 1/5"	20 - 2 1/10	20 - 2 1/10
3	M 18	(-50' - 0")	(E) 1.5	1 3/5"	14 - 8 1/5"	19 - 10 1/6"
4	D 10	(-56 - 5 1/2")	(E) 0.5	4	5 - 2	
5	M 17	(-50' - 0")	0	4	19 - 4 3/10	19 - 4 3/10
6	M 16	(-50' - 0")	(S) 1.5	5 1/10	5 - 4	29 - 10 1/4"
7	D 9	(-56 - 5 1/2")	(E) 1.5	4	15 - 4 1/10	20 - 8 1/10
8	M 15	(-49' - 10")	(S) 0.5	7 9/10	15 - 4 1/10	30 - 8 2/10
9	D 8	(-60' - 8 1/5")	(E) 1.5	4	4 - 11 1/4	20 - 3 3/10
10	M 14	(-50' - 0")	(E) 1.5	3 1/2"	20 - 9/10	20 - 9/10
11	M 13	(-57' - 6")	(S) 0.5	1 3/5"	5 - 0	30 - 1/4
12	D 7	(-60' - 8 2/5")	(S) 0.5	4 1/5"	14 - 10 1/2	19 - 10 1/2
13	M 12	(-57' - 6")	0	0	15 - 1/10	29 - 10 7/10
14	D 6	(-60' - 8 2/5")	(W) 0.5	0	5 - 2 2/5	20 - 2 1/2
15	M 11	(-57' - 6")	0	1 1/5"	19 - 11 3/5	19 - 11 3/5
16	M 10	(-57' - 6")	(W) 1	4 1/5"	5 - 0	30 - 1 1/5
17	D 5	(-65' - 7 2/5")	(W) 1.5	1 1/5"	15 - 1/10	20 - 1/10
18	M 9	(-57' - 6")	(S) 1	3 1/2"	15 - 1/10	30 - 1/5
19	D 4	(-65' - 7 2/5")	(E) 1.5	1 1/5"	4 - 11 1/4	19 - 11 3/5
20	M 8	(-57' - 6")	(W) 0.5	1 3/5"	20 - 9/10	20 - 9/10
21	M 7	(-57' - 6")	(W) 0.5	1 1/5"	5 - 1/5	30 - 1 2/5
22	D 3	(-65' - 7 2/5")	(W) 0.5	1 1/5"	14 - 10 1/6	19 - 11 3/5
23	M 6	(-57' - 6")	(S) 1.5	1 1/5"	15 - 1/10	29 - 10 1/4
24	D 2	(-65' - 7 2/5")	0	1 2/5"	4 - 8 9/10	19 - 9
25	M 5	(-57' - 6")	(W) 0.5	4 1/5"	20 - 5 1/4	20 - 5 1/4
26	M 4	(-57' - 6")	(W) 1	2	4 - 10 5/6	20 - 1 3/4
27	D 1	(-65' - 7 2/5")	(E) 0.5	0	15 - 2 9/10	
28	M 3	(-57' - 6")	(E) 0.5	1 3/5"	19 - 9 2/5	19 - 9 2/5
29	M 2	(-57' - 8 1/10")	(E) 0.5	4	19 - 8 1/5	19 - 8 1/5
30	M 1	(-57' - 6")	(W) 1.5	2		

7.0 Inspection of Magnetometers & Range Console

During February 12 - 22, 1980, A.P. Chuilli, San Diego Magnetic Range Division Director, visited Yokosuka for the purpose of inspecting the operational status of the equipment mentioned above. His findings are recorded in his trip report. See reference No. 1. He mentions making a construction phase inspection trip in his conclusions. Although no record of the trip is available, it appears that an inspection was made with respect to magnetometer locations and overall range performance after the hook-up, as the range was formally accepted and is functioning satisfactorily.



Photo No. 1



Photo No. 2

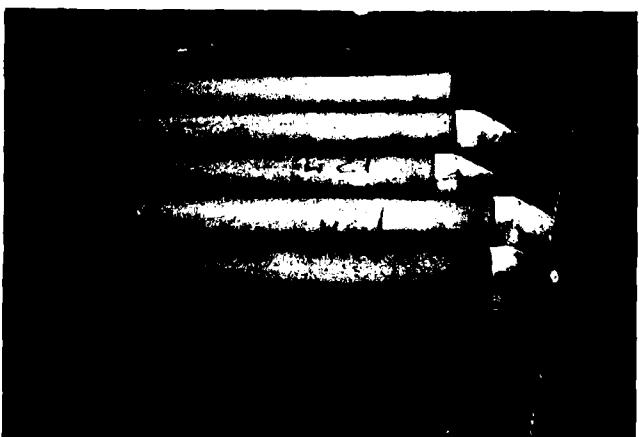


Photo No. 3



Photo No. 4



Photo No. 5

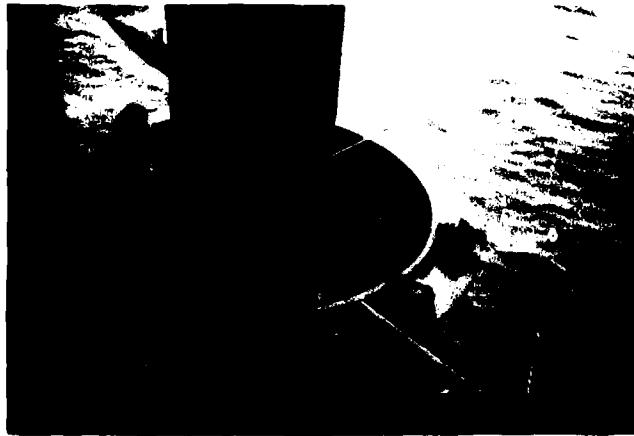


Photo No. 6

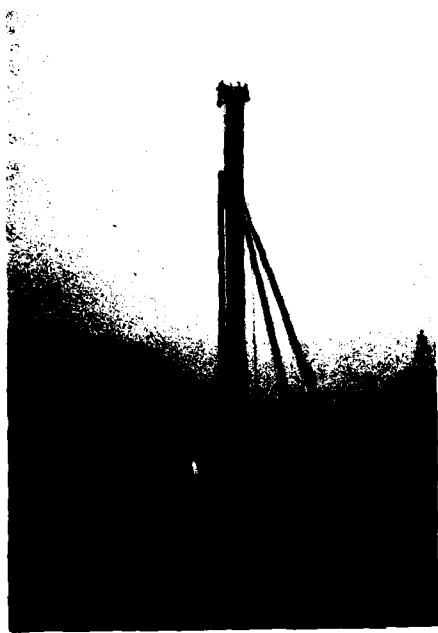


Photo No. 7



Photo No. 8

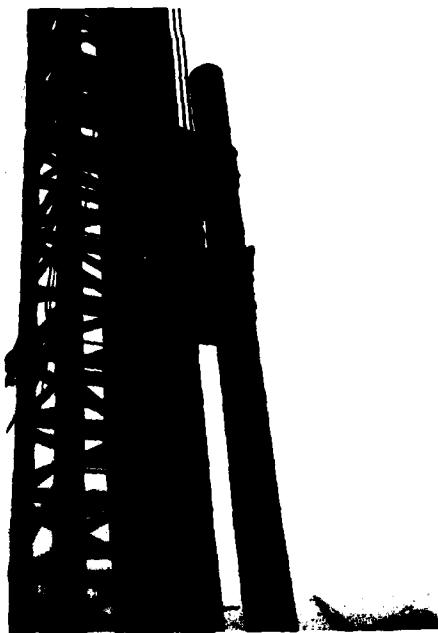


Photo No. 9

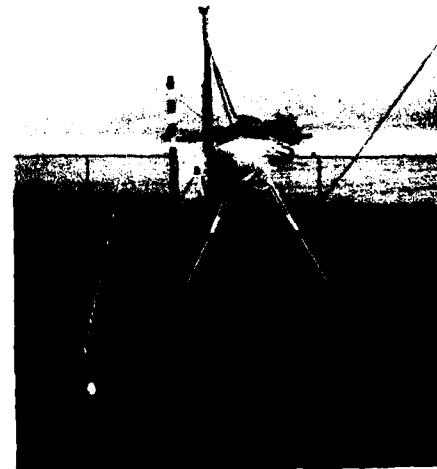


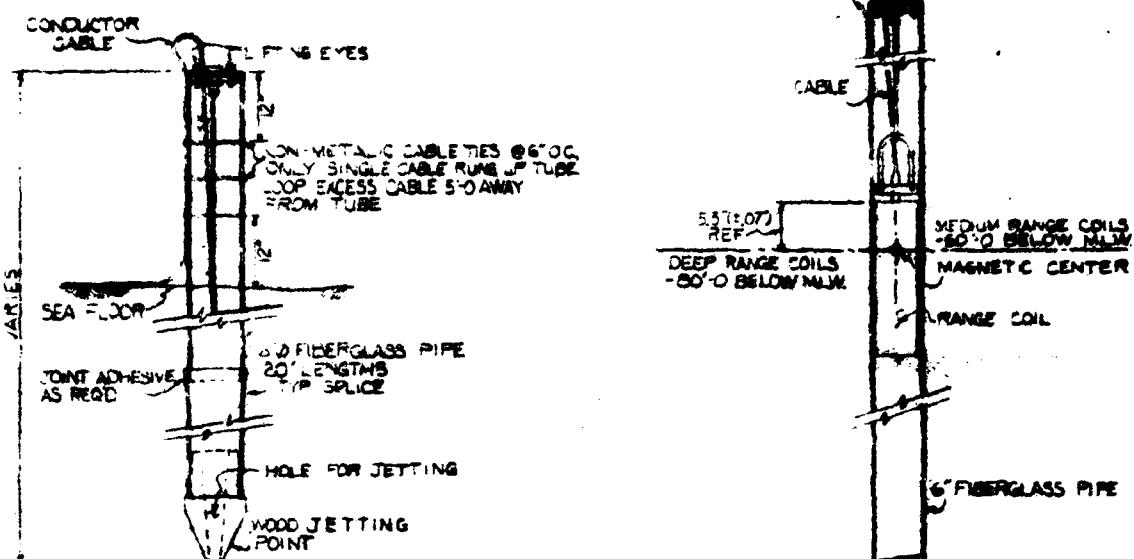
Photo No. 10



Photo No. 11



Photo No. 12



FIBERGLASS TUBE DETAIL

SCALE $1\frac{1}{2}'' \times 1'-0''$

RANGE COIL LOCATIONS

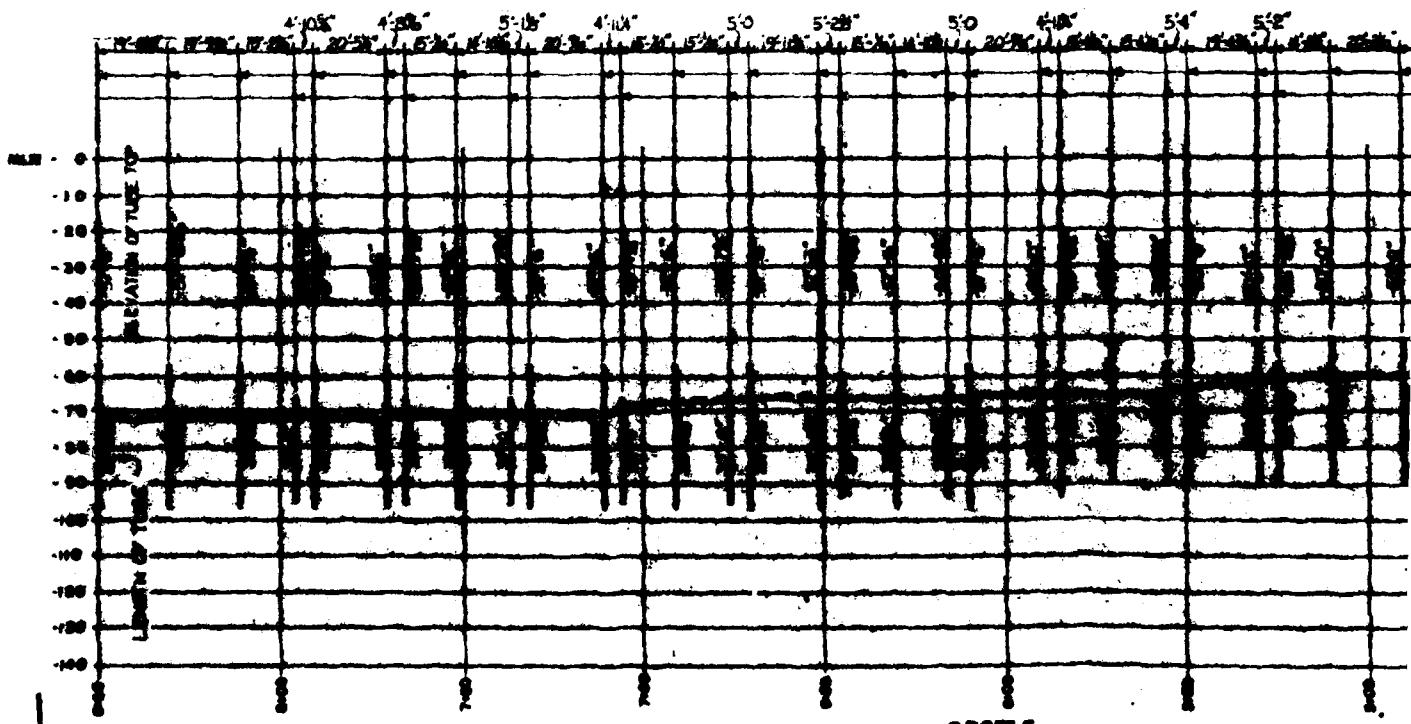
SCALE $1\frac{1}{2}'' \times 1'-0''$

NOTES

1. TOP OF TUBE
2. BOTTOM OF TUBE
3. DEVIATION FROM NEW RANGE LINE SHOWN IN INCHES (NORTH OR SOUTH) TOP OF TUBE.
4. GRADIENT OF TUBE SHOWN IN DEGREES (NORTH, SOUTH, EAST OR WEST).

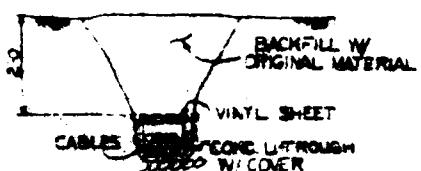
	W-20	W-18	W-16	W-14	W-12	W-10	W-8	W-6	W-4	W-2	W-0	W+2	W+4	W+6	W+8	W+10	W+12	W+14	W+16	W+18	W+20
DEVIATION:	0'	1.05'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	1.95'	
GRADIENT:	2'N	4'N	10'N	2'N	4'N	10'N															
	1.5'N	0.5'E	1'NE	0.5'NE	1.5'S	0.5'W	0.5'W	1.5'E	1.5'W	1.0'W	0'	0'	0'	0'	0'	0.5'S	1.5'E	0.5'S	1.5'E	1.5'S	0.5'E

PLAN



E COILS
W/MW
ENTER

REV 00000000
00000000

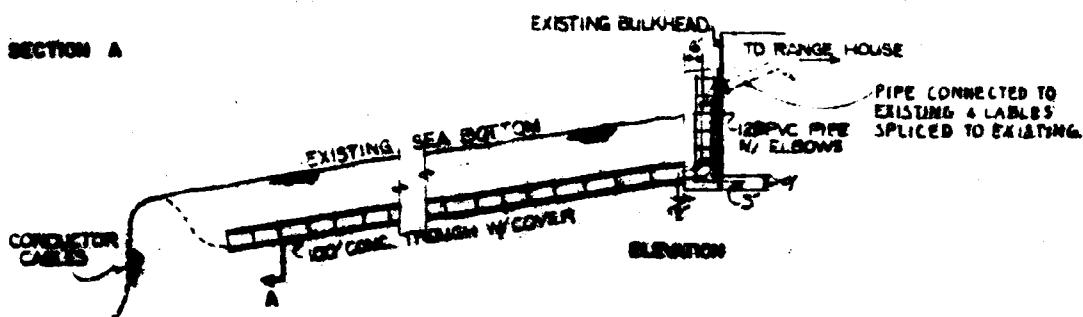


SECTION A

PIPE

DIRECT TOWARD
RANGE
CONCRETE
3000 PSI CAST IN
PLACE CONG.

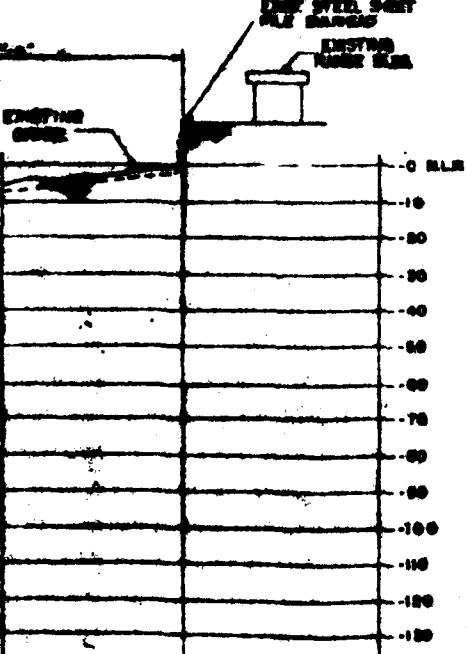
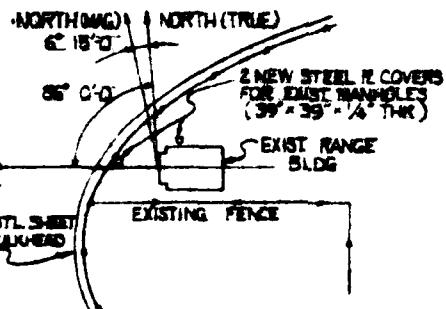
PLAN



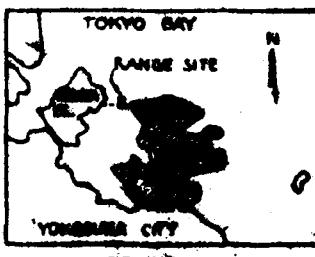
ELEVATION

NEAR SHORE CABLE PROTECTION

SCALE 1'-0"-0"



2



AS BUILT DRAW BY DESIGNER/ENGINEER REC'D BY			
CONTINUOUS DIVISION			
DEBALLING RANGE			
AS BUILT DRAWINGS YOKOHAMA, JAPAN			
100-481F	100-481F	F 10001	1024699
DRAFTED BY: DATE: 10/20/00		RECORDED BY: DATE: 10/20/00	
DRAFTED BY: DATE: 10/20/00		RECORDED BY: DATE: 10/20/00	

APPENDIX A
Contractor's Record
Of
Work For Pile Installation

CHARLIE CHERN
CODE F.P.O 1
CHESDIV NAVFAC
WASH NAVY YARD
CNASW, DC 20374

Appendix A - Contractor's
Record of Work for Pile
Installation

Date	Description of Work	Q'ty	Interrupted Reason	Idle Time/day	Total Time
June 27	Receive Fiberglass tube GFM				MH
28	Splicing tubes	15 pcs			
29	- Ditto -	15 pcs			
30	Cut-off exist. PVC tubes	30 pcs			
July 1	Furnish Tube-drive-ship				
2	Furnish Tube-drive-ship with equipment & device, and put wooden guide into tubes	15 pcs			
3	Install tubes under water	2 pcs	No work in the morning due to sonar test of ship	4 hrs	168 m ¹
4	- Ditto -	3 pcs			168 m ¹
5	- Ditto -	3 pcs			168 m ¹
6	Put wooden guide into tubes	15 pcs			48 m ¹
7	Install tubes under water	1 pc			168 m ¹
8	- Ditto -	2 pcs			168 m ¹
9	- Ditto -	2 pcs	No work for 3 hrs due to a ship traffic	3 hrs 7 hrs	168 m ¹
10	- Ditto -	4 pcs			168 m ¹
11	- Ditto -	4 pcs			168 m ¹
12	- Ditto -	4 pcs			168 m ¹
13	- Ditto -	5 pcs			168 m ¹
14	Dismount equipment and device from Tube-drive-ship				
15	Survey work to assure of the top level of each tube				7 hrs

THIS WAS OBTAINED FROM CONTRACTOR
YOU ASKED FOR THIS INFO DURING PHONE CONVERSATION

B. Murphy

Ave
58 hrs/
tube

MAN
HOURS

168 m¹

APPENDIX B

Government Inspection Record
(Field Note)

Memorandum

Appendix B - Government
Inspection Record (field
note)

FROM

TO

SUBJ	TYPE INSPECTED	UCT 2 RESULTS	CONTRACTORS PROFILE
	2	1°	1.5°
	4	.7°	1.5°
	15	.5°	0°
	20	.5°	0°
	23	.6°	1.5°
	30	0°	1.5°

THE INCLINOMETERS WERE DIFFERENT FOR BOTH
TESTS.

APPENDIX C

Specifications

For

Replacement Of Degaussing Range

At The

U.S. Fleet Activities, Yokosuka, Japan

DEPARTMENT OF THE NAVY
OFFICER IN CHARGE OF CONSTRUCTION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACTS, FAR EAST

SPECIFICATION
No. 42-80-0277

CONTRACT NO: N62836-80-C-0277
APPROPRIATION: 1701804

NOTICE:

Bids to be opened at
11:00 a. m., Japan Standard Time
on 18 April 1980
at the office of the
Officer in Charge of Construction
Naval Facilities Engineering Command
Contracts, Far East, Building F-60
at the U. S. Fleet Activities, Yokosuka, Japan

Replacement of Degaussing Range
at the
U. S. Fleet Activities, Yokosuka, Japan

DESIGNED BY: Ocean Engineering and Construction
Project Office (Code FPO-1)
Chesapeake Division
Naval Facilities Engineering Command
Washington, DC. 20374

Specification Prepared by: C. Chern

NOTICE

All inquiries concerning any phase of this specifications, prior to bid openings, shall be made to the Officer in Charge of Construction, Naval Facilities Engineering Command Contracts, Far East, Building F-60 at the U. S. Fleet Activities, Yokosuka, Japan. The Government Specifications, and forms mentioned and other information necessary may be obtained, or examined, and non-government publications may be examined, on application to the above office.

WR # 02158

CONTENTS

DIVISION 1 GENERAL REQUIREMENTS

SECTION

- 01011 General Paragraphs
- 01012 Additional General Paragraphs
- 01401 Quality Control (Non-CQC Project)
- 01501 Environmental Protection
1C Bids

DIVISION 2 SITE WORK

Section

- 02110 Demolition and Removals
- 02200 Earthwork
- 02320 Instrumentation Tube Installation

DIVISION 3 CONCRETE

Section

- 03300 Cast in Place Concrete

DIVISION 16 ELECTRICAL

Section

- 16910 Underwater Electrical Work

SECTION 01011
GENERAL PARAGRAPHS

1. GENERAL INTENTION: It is the declared and acknowledged intention and meaning to provide and secure the replacement of degaussing range complete and ready for use.

2. GENERAL DESCRIPTION: The Contractor shall:

- (1) demolish and remove underwater wood piles in the existing degaussing range,
- (2) install new underwater fiberglass instrumentation tubes,
- (3) install magnetometer probes, detector cables, and
- (4) connect the installed degaussing range to the control house.

3. LOCATION: The work shall be at the U.S. Fleet Activities, Yokosuka, Japan. The exact location will be indicated by the Officer in Charge of Construction (OICC).

4. COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK: The Contractor will be required to commence work under the contract within 10 calendar days after the date of receipt by him of "Notice of Award" to prosecute said work diligently, and to complete the entire work ready for use within 150 calendar days. The time stated for completion shall include final cleanup of the premises. The contract completion date will be computed starting 15 calendar days after the date of Notice of Award. This 15-day period is to allow for mailing of the Notice of Award and the Contractor's submission of required Bonds, Insurance, and other documents that may be required.

5. LIQUIDATED DAMAGE: In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or extension thereof, the Contractor shall pay to the U.S. Government as liquidated damages pursuant to Clause entitled "Termination for Default - Damages for Delay - Time Extension", and "Damage for Delay - Defense Materials System and Priorities" of the General Provisions the sum of ¥8,750 for each day of delay.

6. DRAWINGS ACCOMPANYING SPECIFICATION: The following drawings accompany this specification and are a part thereof. The drawings are the property of the U.S. Government and shall not be used for any purpose other than contemplated by the specification. Sets of drawings and specifications will be furnished upon receipt of ¥ 0 per set. Payment shall be made by cash, bank-issued check or money order and be delivered to OICC FAR EAST. Check and money orders should be made payable to "Treasurer of the United States."

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NAVFAC DWG NO.3024899
3024900TITLEPlan and Profile
Installation Details

7. GOVERNMENT-FURNISHED MATERIALS (GFM): The Government will furnish the materials listed below for installation by the Contractor, in accordance with Clause entitled "Government-Furnished Property" of the General Provisions. The materials will be available at Bldg. J-530. The Contractor shall disconnect, load, transport, unload, uncrate, assemble, install, connect, and test all new and existing Government-furnished materials. New Government-furnished materials shall be uncrated by the Contractor in the presence of the OICC's representative to determine any damage or missing parts. The Contractor shall notify the OICC in writing at least 14 days in advance of the date the Government-furnished materials will be needed.

<u>Item No.</u>	<u>Description of item</u>	<u>Unit</u>	<u>Quantity</u>
1	Magnetometer Probe	ea	34
2	Fiberglass Tube, 6"Øx20' Long, Sch. 40	ea	60
3	Fiberglass Pipe Adhesive	Kit	30
4	NOT USED		
5	NOT USED		
6	Clamp for Pipe Cover	ea	80
7	NOT USED		
8	Conductor Cable/Magnetometer Assembly	ea	30
9	Nylon Cable Tie (7 1/2" Min. Bundle Diameter)	ea	600
10	NOT USED		
11	Grounding Plate Assembly (12" x 12" x 1/4" with 2-#10AWG)	ea	1

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3. CONTRACT PRICE: The contract price shall be in Japanese Yen. Payment shall be made in Japanese Yen upon the contract award amount.

9. BID AND PERFORMANCE BONDS: Bid and Performance Bonds shall be provided in accordance with instruction to Bidders.

10. EXISTING CONDITION: The Contractor shall verify existing conditions and take all field measurements necessary prior to ordering or fabrication of materials.

11. AVAILABILITY OF UTILITIES SERVICES: Clause entitled "Availability and Use of Utility Services" of the General Provisions applies. Reasonable amount of utilities will be made available to the Contractor at the rate as determined by the OICC. Connection to designated utilities outlets shall be made by the Contractor at his expense.

12. UTILITIES OUTAGES: The Contractor shall schedule his work to ensure that outage of the existing utilities be kept to a minimum. The Contractor shall obtain utilities outage approval ten (10) days in advance.

13. WORKING DIRECTIVE: All on-site work operations shall be coordinated with COMFLEACT Yokosuka through OICC to minimize interference with ship traffic.

13.1 All work shall be done with care to avoid damage to the existing construction and installations. All portions of existing work which have become exposed, cut, damaged or altered in any way during the new work shall be repaired and restored in an approved manner to match the existing adjoining work and at no additional cost to the Government. Existing work at the completion of all operations shall be left in a condition as good as existed before the new work started. Where the method of repair work is not indicated or specified, the Contractor shall perform the repair work in accordance with the best recognized workmanlike procedure subject to the approval of the OICC.

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13.2 Protection of Persons and Property: Adequate protection to persons and property shall be provided at all times. No materials or debris shall be burned at the premises.

13.3 Cleaning: The Contractor shall clean his job site, hut and material storage area at all times in a manner approved by the OICC. Upon completion of the Contract, all materials, hut and other property belonging to the Contractor shall be removed from the site and the area shall be cleaned and restored to its original condition.

13.4 Trash and debris resulting from the Contractor's work shall be removed from the site daily or as directed to maintain cleanliness of the job site at all times.

END

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SECTION 01401
QUALITY CONTROL (NON-CQC PROJECT)

1. QUALITY CONTROL: Quality Control of this contract will be administered under the General Provisions entitled "Contractor Inspection System."

2. DEFINITIONS:

2.1 Field Test: Test or analyses made at, or in the vicinity of the job site in connection with the actual construction.

2.2 Product: The term "product" includes the plural thereof and means a type or a category of manufactured goods, constructions, installations and natural and processed materials or those associated services whose characterization, classification or functional performance determination is specified by standards.

2.3 Person: The term "person" means associations, companies, corporations, educational institutions, firms, government agencies at the Federal, State and local level, partnerships, and societies, as well as divisions thereof, and individuals.

2.4 Certified Test Reports: Certified test reports are reports of tests signed by a qualified professional attesting that tests were performed in accordance with the test method specified, that the test results reported are accurate, and that items tested either meet or fail to meet the stated minimum requirements.

3. SUBMITTALS: Submittals shall be prepared in accordance with the General Provisions and submitted to the OICC for approval. Each submittal shall be accompanied with a cover letter signed by the Contractor. Each item proposed to be incorporated into the contract shall be clearly marked and identified in the submittals, and shall be cross-referenced to the contract drawings and specifications so as to identify clearly the use for which it is intended. Each sheet of submittal shall be stamped with the Contractor's certification stamp. Data submitted in a bound volume or on one sheet printed on two sides, may be stamped on the front of the first sheet only. The Contractor's certification stamp shall be worded as follows:

"It is hereby certified that the (equipment) (materials) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62836-80-C-0277 is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by _____ Date _____"

The person signing the certification shall be one designated in writing by the Contractor as having that authority. The signature shall be in original ink. Stamped signatures are not acceptable.

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4. QUALITY CONTROL REQUIREMENTS: In accordance with the General Provisions Clause entitled "Contractor Inspection System," the Contractor shall inspect and test all work under the contract and maintain records of the inspections and tests. Approvals, except those required for field installations, field applications, and field tests, shall be obtained before delivery of materials and equipment to the project site. Surveillance of the inspection system will be performed by the OICC.

4.1 Field Tests by the Contractor: The Contractor shall furnish all equipment, instruments, qualified personnel, and facilities necessary to inspect all work and perform all tests required by the contract. All tests performed and test results received each day shall be included in the Daily Report to Inspector.

4.2 Field Inspection by the Government: Field inspections conducted by the Government will be made in accordance with the General Provisions Clause entitled "Inspection and Acceptance."

4.3 Repeated Test and Inspections: The Contractor shall repeat tests and inspections after each correction made to nonconforming materials and workmanship until tests and inspections indicate the materials, equipment, and workmanship conform to the contract requirements. The retesting and re-inspections shall be performed at no additional cost to the Government.

4.4 Daily Report to Inspector: "The Daily Report to Inspector", Form NAVFAC 4330/34 shall be submitted to the OICC by 10:00 AM on the working day following the day the work was performed.

END

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SECTION 01501
ENVIRONMENTAL PROTECTION

1. ENVIRONMENTAL PROTECTION PLAN: The Contractor shall be responsible for the preparation and submission of an environmental protection plan. After the contract is awarded, prior to the commencement of the work, the Contractor shall meet with the OICC, or his representative, and discuss the proposed environmental protection plan. The meeting shall develop mutual understanding relative to details of environmental protection, including required reports and measures to be taken should the Contractor fail to provide adequate protection in an adequate and timely manner. No more than 14 days after the meeting the Contractor shall submit for approval his proposed environmental protection plan.

2. GENERAL REQUIREMENTS: The Contractor shall provide and maintain environmental protection during the life of the contract as defined herein. Environmental protection shall be provided to correct conditions that develop during the construction of permanent environmental protection features, or that are required to control pollution that develops during normal construction practices but are not associated with permanent control features incorporated in the project. The Contractor's operations shall comply with all Federal, State, and local regulations pertaining to water, air, solid waste, and noise pollution. (See General Provision 12).

3. PROTECTION OF NATURAL RESOURCES:

3.1 General: It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed under this contract be preserved in their existing conditions or be restored to an equivalent or improved condition upon completion of the work. The Contractor shall confine his construction activities to areas defined by the work schedule, plans, and specifications.

3.2 Oily Substances: At all times, special measures shall be taken to prevent oily or other hazardous substances from spreading on the water.

3.3 Fish Resources: The Contractor shall at all times perform all work and take such steps required to prevent any interference or disturbance to fish. The Contractor will not be permitted to alter water flows or otherwise significantly disturb native habitat adjacent to the project area which are critical to fish except as may be indicated or specified.

END

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SECTION 1B. ADDITIONAL GENERAL PARAGRAPHS.

1. FROMS:

1.1 OICC FAR EAST 4330/101: Clause 24, 25, 28, 29, 79, 82, 93, 96, & 97 shall not apply to this contract. Clauses 6, 30 & 65 are modified for use in Japan.

1.2 Taxes, duties, and charges for doing business (1966 Oct):

(a) To the extent that contract provides for the furnishing of supplies or the performance of services outside the United States, its possessions, and Puerto Rico, the following clause is applicable in lieu of the clause in this contract, if any, entitled "Federal, State, and Local Taxes."

(b) As used throughout this clause, the words and terms defined in this paragraph shall have the meanings set forth herein.

(i) The term "country concerned" means any country in which expenditures under this contract are made.

(ii) The words "tax" and "taxes" include fees and charges for doing business that are levied by the Government of the country concerned or by political subdivisions thereof.

(iii) The term "contract date" means the date of this contract or, if this is a formally advertised contract, the date set for bid opening; as to additional supplies or services procured by modification to this contract, the term means the date of the modification.

(c) Except as may be otherwise provided in this contract, the contract price include all taxes and duties in effect and applicable to this contract on the contract date, except taxes and duties (i) from which the Government of the United States, the Contractor, any subcontractor, or the transactions of property covered by this contract are exempt under the laws of the country concerned or political subdivision thereof, or (ii) which the Government of the United States and the Government of the such country by or on behalf the United States.

(d) (1) If the contractor is required to pay or bear the burden:

(i) of any tax or duty which either was not to be included in the contract price pursuant to the requirements of paragraph (c) hereor, or was specially excluded from the contract price by a provision of this contract; or

(ii) of an increase in rate of any tax or duty, whether or not such tax or duty excluded from the contract price; or

(iii) of any interest or penalty on any tax or duty referred in (i) or (ii) above.

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The contract price shall be correspondingly increased; provided that the Contractor warrants in writing that no amount of such tax, duty, or increase therein was included in the contract price as a contingency reserve or otherwise; and provided further, that liability for such tax, duty, increase therein, interest or penalty was not incurred through the fault or negligence of the Contractor or his failure to follow instructions of the OICC or to comply with the provisions of subparagraph (e) (1) below.

(2) If the Contractor is not required to pay or bear the burden, or obtains a refund or drawback, in whole or in part, of any tax, duty, increase therein, interest or penalty which (i) was to be included in the contract price pursuant to the requirements of paragraph (c), (ii) was included in the contract price, or (iii) was the basis of an increase in the contract price, the contract price shall be correspondingly decreased or the amount of such relief, refund, or drawback shall be paid to the Government of the United States, as directed by the OICC. The contract price also shall be correspondingly decreased if the Contractor, through his fault or negligence or his failure to follow instruction of the OICC or to comply with the provisions of subparagraph (e) (1) below, is required to pay or bear the burden, or does not obtain a refund or drawback of any such tax, duty, increase therein, interest or penalty. Interest paid or credited to the Contractor incident to a refund of taxes or duties shall insure to the benefit of the Government of the United States to the extent that such interest was earned after the Contractor was paid or reimbursed by the Government of the United States for such taxes or duties.

(3) If the Contractor obtains a reduction in his tax liability under the United States Internal Revenue Code of 1954, as amended (Title 26 U.S. Code), on account of the payment of any tax or duty which either (i) was to be included in the contract price pursuant to the requirements of paragraph (c) of this clause, (ii), was included in the contract price, or (iii) was the basis of an increase in the contract price, the amount of the reduction shall be paid or credited to the Government of the United States as the OICC directs.

(4) Invocies or vouchers covering any adjustment of the contract price pursuant to this paragraph (d) shall set forth the amount thereof as separate item and shall identify the particular tax or duty involved.

(5) No adjustment in the contract price or payment or credit to the United States is required pursuant to this paragraph (d) if the total amount thereof for the contract period will be less than one hundred dollars (\$100).

(6) Subparagraphs (1) and (2) of this paragraph (d) shall not be applicable to social security taxes; income and franchise taxes, other than those levied on or measured by (i) sales or receipts from

sales, or (ii) the Contractor's possession of, interest in, or use of property, title to which is in the Government; excess profits taxes; capital stock taxes; transportation taxes; unemployment compensation taxes; or property taxes, other than such proper taxes, allocable to this contract, as are assessed either on completed supplies covered by this contract, or on the Contractor's possession of, interest in, or use of property, title to which is in the Government.

(e) (1) The contractor shall take all reasonable action to obtain exemption from or refund of any taxes or duties, including interest or penalty, from which the United States Government, the Contractor, any subcontractor, or the transaction or property covered by this contract are exempt under the laws of the country concerned or political subdivisions thereof, or which the Government of the United States and the government of the country concerned have agreed shall not be applicable to expenditures in such country or on behalf of the United States.

(2) The Contractor shall promptly notify the OICC of all matters pertaining to taxes or duties which reasonably may be expected to result in either an increase or a decrease in the contract price.

(3) Whenever an increase or decrease in the contract price may be required under this clause, the contractor shall take action as directed by the OICC, and the contract price shall be equitably adjusted to cover the cost of such action, including any interest, penalty, and reasonable attorneys' fees.

1.3 Mandatory insurance coverage: Clause 65 of OICC FAR EAST 4330/101 is amended in that prior to commencement of the work and not later than fifteen (15) days after the award of this contract, the successful bidder shall furnish to the OICC a certificate of insurance as evidence of the existence of the following insurance coverage in amounts not less than the amounts specified below:

<u>Type of Insurance</u>	<u>Coverage</u>		
	<u>Per persons</u>	<u>Per accident</u>	<u>Property</u>
Comprehensive General Liability	¥3,000,000	¥30,000,000	¥3,000,000
Japanese Compulsory Auto Insurance	As required by Japanese Law.		
Additional Automobile Liability	¥1,500,000	¥3,000,000	¥1,500,000
Workmen's Compensation	As required by Japanese Law.		
Other Insurance	As required by Japanese Law.		

The Comprehensive General and Automobile Liability policies shall contain a provision worded as follows:

"The insurance company waives any right of subrogation against the United States of America which may arise by reason of any payment under the policy."

The certificate of all policies shall provide for notice of cancellation to be sent to the OICC and the Certificates shall indicate that the above provision has been included.

1.3.1 The prime Contractor shall also furnish such a similar certificate of insurance as evidence of the existence of such coverage for all subcontractor who work on the job. This certificate shall be furnished not less than five days before subcontractor forces enter the Government premises.

1.4 Hold harmless clause: The Contractor indemnifies and holds harmless the Government, its agencies and instrumentalities against all suits, actions, claims, costs or demands (including, without limitation, suits, actions, claims, costs or demands resulting from death, personal injury and property damage) to which the Government, its agencies and instrumentalities may be subject by reason of damage or injury (including death) to the property or person of any one other than the Government, its agencies, instrumentalities and personnel, arising or resulting in whole or in part from the fault, negligence, wrongful act, or wrongful omission of the Contractor or any subcontractor, its or their servants, agents or employees. Such indemnity shall include, without limitation, suits, actions, claims, costs or demands of any kind whatsoever, resulting from death, personal injury or property damage occurring during the period of performance of the work under the contract, provided, however, that such indemnity shall apply to death occurring after such period which results from any personal injury received during the period covered by the Contractor's indemnity as provided herein.

1.5 Conciliation clause: Except as otherwise provided in this contract any disagreement arising under this contract which is not resolved by the parties to this contract may be submitted to the US-Japan Committee for conciliation in accordance with paragraph 9, Article XVIII, of the Status of Forces Agreement under Article VI, of the Treaty of Mutual Cooperation and Security between Japan and United States of America. Request by the Contractor for conciliation shall be made in accordance with the following procedures:

1.5.1 In the event the Contractor desires conciliation after the decision of the OICC has been served upon him, he will first file his appeal from such findings of fact with the Commander, NAVFAC Engineering Command before filing request for conciliation with the Joint Committee, and then request the Commander, NAVFAC Engineering Command to withhold the action on his appeal until such time as the Joint Committee has had an opportunity for effecting conciliation. The appeal to the Commander NAVFAC Engineering Command will be submitted via the OICC and the Commander, PACDIV, NAVFAC Engineering Command.

1.5.2 The request for conciliation will be submitted by the contractor through the appropriate Defense Facilities Administration Bureau office to the Contract Conciliation Panel of the Joint Committee. Upon the

filing of the request with the Joint Committee, the Contractor will immediately notify the OICC in writing that the request for conciliation has been filed.

1.5.3 In the event the disagreement submitted to the Joint Committee under subparagraph 1B.1.5.2 above has been resolved through conciliation, it will be the responsibility of the Contractor to notify the above appellate authority of the settlement of the dispute and to withdraw his appeal.

1.5.4 In the event the Contractor who has submitted a request for conciliation to the Joint Committee under subparagraph 1B.1.5.2 above desires, notwithstanding pendency of his request for conciliation, that action by the Commander, NAVFAC Engineering Command be resumed on his appeal, it is his responsibility to so request the Commander, NAVFAC Engineering Command in writing. The Joint Committee shall be immediately informed by the Contractor of his action taken hereunder.

1.5.5 No request for conciliation can be submitted to the Joint Committee in the case of a dispute upon which the final decision of the Commander NAVFAC Engineering Command has been rendered. Pending the hearing of conciliation panel the contractor shall proceed diligently with the performance of the contract and in accordance with the OICC's decision. The provision of this clause shall not prejudice any right which the parties to the contract may have to file a civil suit.

2. RATE OF WAGES AT THE SITE: The minimum wages required to be paid to tradesmen and laborers employed directly upon the site of the work shall be in accordance with the Japanese Law and prevailing local wage rates. Contractor will only employ workmen who have been properly screened for work on the station and to whom gate passes can be issued.

3. MATERIALS FROM SOVIET-CONTROLLED AREAS: No material, supplies, or manufactured products originating from sources within Communist-controlled countries or areas shall be used, furnished or installed under this contract. The prohibited areas presently include: Albania, Bulgaria, China, [excluding Taiwan (Formosa)], Viet Nam, Cambodia, Laos, Cuba, Czechoslovakia, East Germany (Soviet zone of Germany and Soviet section of Berlin), Estonia, Hungary, Latvia, Lithuania, North Korea, Outer Mongolia, Poland and Danzig, Rumania, and Union of Soviet Socialist Republics.

3.1 The Contractor shall not acquire for use in the performance of this contract any supplies or services originating from sources within Communist-controlled areas as listed above, or transported through or from Hong Kong or Macao, without written approval of the OICC.

3.2 The Contractor agrees to insert the provisions of paragraphs 1B.3 and 1B.3.1 in all subcontracts hereunder.

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4. PERFORMANCE OF THE WORK, AND SAFETY: The Contractor and his employees shall be subject to all orders and regulations promulgated by the Commanding Officer of the activity concerned, for purpose of insuring base security, cleanliness, and protection from fire hazards. Unless the use of other sanitary facilities is authorized, the Contractor shall provide such conveniences in accordance with Clause 72 OICC FAR EAST 4330/101. The Contractor shall take every reasonable and practicable precaution as concerns the prevention of fire at work sites. Temporary wiring shall be held to a minimum, and shall be properly insulated and supervised by a competent electrician. The use of unattached salamanders or other heating devices is prohibited. Proper precautionary measures shall be taken in the use of tar kettle, welding and cutting equipment, flammable liquids, and gasoline powered equipment. Gasoline engines shall be shut off during refueling operations. The maintenance of good order and cleanliness is stressed - the removal of combustible formwork, scaffolding, material storage, and temporary building - when no longer needed - is mandatory. A daily cleanup of scrap, lumber, paper, cement sacks and other building debris shall be accomplished. For open fires of any type, a proper permit from the Base Fire Department must be obtained by application to the OICC. Special care must be exercised when working around electric power line which are installed on the buildings.

4.1 Contractor participation in safety program: In addition to the requirements of Clause 43 of OICC FAR EAST 4330/101, and prior to commencement of work at the site(s), the Contractor or his appointed representative(s), preferably the man (men) who will be responsible for the work at the site(s), will be required to attend a pre-construction conference. The pre-construction conference will be convened at a time and place mutually agreeable to the Contractor and the OICC/ROICC, prior to commencement of work at the site. Safety and other requirements of the work at the site(s) will be discussed during the pre-construction conference. If the Contractor contemplates that a part of the work at the site(s) will be accomplished by a subcontractor(s), the subcontractor(s) shall be represented at the pre-construction conference by his (their) supervisors.

4.1.1 At the pre-construction conference, the Contractor and his subcontractor will be required to submit for review and discussion a written safety plan which references applicable portions of a safety code(s); for example, Safety and Sanitation Section of the Japan Labor Standard Law.

4.1.2 On the job safety meetings: All Contractor and subcontractor personnel working under this contract at the site(s) shall attend a weekly safety meeting of at least 5 minutes duration. The meeting need not last more than 10 minutes unless the Contractor desires a longer meeting. No change in contract price shall be entertained because of these meetings. A representative of the OICC may attend these meetings.

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It behooves the Contractor to incite active participation in these meetings to promote the highest possible degree of safety at the work site(s).

4.1.3 Accident reports: The Contractor shall report all lost time injuries on OICC FE Form 1-61 (Contractor's Report of Accident) within three days following the lost time injury. Accident reports shall not be held up for return to work of the injured employee. The Navy inspector or the Contractor's job supervisor shall estimate the injury time loss.

5. MAN HOURS REPORT: In addition to the daily report required by Clause 90, OICC FAR EAST 4330/101, the Contractor shall make a written report to the OICC/ROICC which shall indicate the number of man hours expended each month under this contract. Such report shall be forwarded within three (3) working days following the end of the month.

6. INTERPRETER: The Contractor shall furnish the services of an interpreter on the job. The interpreter shall have an adequate knowledge of English and of construction work to avoid confusion in the translation of technical terms. His services must be available at all times during working hours and must prove satisfactory to the OICC.

7. DISCREPANCIES, CONFLICTS, AMBIGUITIES OR OMISSIONS IN BIDDING DATA: In order that all bidders on construction contracts may have identical information upon which to base their bids, Contractors noting any discrepancies, conflicts, ambiguities, errors or omission in bidding data will submit requests for clarification to the OICC not later than one week prior to the date of the opening of the bids. All questions shall be submitted typewritten in duplicate; they will be answered in the form of an amendment to all bidders.

8. CONSTRUCTION SIGN: Within 30 days after notice to proceed, the Contractor shall provide a construction identification sign at the location designated by the Contracting Officer. The sign shall be constructed with a face sheet of 2.43 m by 3.05 m exterior grade plywood, 13 mm thick, mounted on a substantial frame of treated lumber. All parts of frame and sign shall be given one coat of lead-free alkyd oil primer paint and two coats of an exterior type white enamel. Lettering and further details of construction shall be in accordance with the drawings.

9. SAFETY SIGN: Safety sign, constructed in accordance with NAVFAC Dwg. 1221723, shall be provided at the start of construction in the location indicated or directed. Drawing No. 1221723 is available upon request to the OICC. Upon completion of the contract, the sign shall be the property of the Government.

10. GENERAL REQUIREMENTS: The Contractor shall provide all required materials, supplies and articles and shall furnish all required labor, transportation, consumables, tools and equipment as required to carry out completely the intent of the drawings and these specifications.

11. EMPLOYMENT OF OCEAN-GOING VESSELS:

(a) If ocean transportation is required after the date of award of this contract to bring any supplies, materials, or equipment to the construction site from the United States either for use in performance of or incorporation in the work called for by this contract, United States-flag vessels shall be employed in such transportation to the extent such vessels are available at fair and reasonable rates for United States-flag vessels. The Contractor shall not make any shipment exceeding ten measurement tons (11.32 cubic meter) by other than a United States-flag vessel without notifying the OICC that United States-flag vessels are not available at fair and reasonable rates for such vessels and obtain his permission to ship in other vessels. If such permission is granted, the contract price shall be equitably adjusted to reflect the difference in cost.

(b) The Contractor shall include the substance of this clause, including this paragraph (b), in each subcontract or purchase order which may involve the ocean transportation of construction supplies, materials, or equipment from the United States.

12. NON-USE OF FOREIGN-FLAG VESSELS ENGAGED IN CUBAN AND NORTH VIET NAM TRADE (APR. 1966):

(a) If, after the date of award, any supplies to be furnished for, or any material to be incorporated in, a construction project will require ocean transportation from the United States in the performance of this contract, the Contractor shall not use any foreign-flag vessel which the Maritime Commission has listed in the Federal Register as having called at a Cuban Port after 1 Jan. 1963 or a North Vietnam Port after 25 Jan. 1966 unless an exception has been made by the Secretary of Commerce.

(b) For purpose of this clause, the term "United States" includes the fifty States, Puerto Rico, Possessions of the United States, and the District of Columbia.

(c) The Contractor shall include the substance of this clause, including this paragraph (c), in each subcontract or purchase order which may involve ocean transportation from the United States.

13. IDENTIFICATION OF EXPENDITURES IN THE UNITED STATES (OCT. 1966):

(a) On each invoice, voucher or other request for payment under this contract, the Contractor shall identify that part of the requested payment which represents estimated expenditures in the United States. Identification shall consist of stating the full amount of the payment request, subdivided into the following categories:

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1. United States end products-expenditures for materials and/or equipment in the United States, excluding transportation.

2. United States service-expenditures for services performed in the United States, including charges for overhead, other indirect costs, and profit;

3. Transportation on United States Carriers-Expenditures for transportation furnished by United States flag, ocean, surface, and air carriers; and

4. Expenditures not identified under 1, 2, and 3 above.

(b) If this contract is principally for supplies or if the Contractor is not an incorporated concern incorporated in the United States, or an unincorporated concern having its principal place of business in the United States, the amounts identified under (a) 1, 2 and 3 above will be limited to payments made pursuant to the requirements either of the "United States Products and Services" clause, if any, or of any other specific provision of this contract that obligates the Contractor to procure certain materials, equipment, transportation, or services from United States sources.

(c) The identification of expenditures required under (a) above may be expressed either as dollar amounts or as percentage applicable to the total amount of the request for payment.

(d) The identification will be based on reasonable estimates by the Contractor. Nothing in this clause requires the establishment or maintenance of detailed accounting records or gives the United States Government any right of audit of the Contractor's books or records.

14. SALVAGE: All existing materials which have been removed or disconnected, and in the opinion of the OICC are sound and of value, but not indicated or specified for reuse in the new work, shall remain the property of the Government and shall be stored by the Contractor at his expense until the material is transferred, by the end of the contract, as directed by the OICC.

15. WARRANTY: In addition to the warranty required by Clause 62 of OICC FAR EAST 4330/101, General Provision (Construction Contracts), the Contractor warrants all mechanical and electrical equipment to be free from defects of design, material and workmanship, for a period of one year from date of acceptance of the work. The Contractor, promptly after receipt of notice, shall make good at his expense all defects developing during this period.

16. RECORD DRAWINGS: The Contractor shall maintain at the job site two sets of full size contract drawings, marking them in red to show all variations between the construction actually provided and that indicated

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or specified in the contract documents, including buried or concealed construction. Where a choice of materials or methods is permitted herein, or where variations in scope or character of work from that of the original contract are authorized, the drawings shall be marked to define the construction actually provided. The presentation of such changes shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as necessary to clearly portray the as-built construction. On completion of the work, both sets of marked-up drawings shall be delivered to the OICC, and shall be subject to his approval before acceptance.

17. DRAWINGS REQUIRED OF CONTRACTOR: Specification MIL-D-1000 shall be used as a guide, and its use is encouraged, for all drawings and data submitted by the Contractor. Conformance to the provisions of specification MIL-D-1000 is not mandatory for maps, sketches, presentation drawings, perspectives, renderings, and all other drawings not requiring Naval Facilities Engineering Command Drawings Numbers. Before starting the fabrication or installation of any of this work, the Contractor shall submit, and receive approval of, in accordance with Clause 15 of Form OICC FAR EAST 4330/101, General Provisions (Construction Contracts) such drawings as may be required by the OICC.

18. PROGRESS CHART AND EQUIPMENT DELIVERY SCHEDULE:

18.1 Progress Charts: The Contractor shall, within 15 days after receipt of notice of award, prepare and submit to the OICC for approval, a practicable construction schedule in accordance with Clause entitled "Progress Charts and Requirements for Overtime Work" of the General Provisions except as modified herein. The schedule shall be in the form of a progress chart on PWCEN Form 4335-2.

18.2 Equipment Delivery Schedule: The Contractor shall, within 10 days after date of award, submit to the OICC for approval, a schedule showing the procurement plans for materials, plant and equipment. The data shall be submitted in the format prescribed by the OICC and shall include but not be limited to the following information:

- a. Description.
- b. Date of purchase order.
- c. Proposed shipping date.
- d. Name of manufacturer or supplier.
- e. Date of delivery is expected.
- f. Date material or equipment is required according to current progress schedule or network.

The Contractor shall update the progress chart and equipment delivery schedule at monthly intervals or at intervals directed by the OICC. The revised documents shall reflect any changes occurring since the last updating. The Contractor shall also submit copies of purchase orders and confirmation of delivery dates as directed by the OICC.

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Updated progress charts and equipment schedules shall be submitted with each invoice for progress payment (see clause entitled "Progress Charts and Requirements for Overtime Work" of the General Provisions).

18.3 Network System: Optionally, the Contractor may use the "CPM" (Critical Path Method), the "PERT" (Program Evaluation and Reporting Technique), or, subject to approval of the OICC, some other system which will give similar and equal information and control to that provided by the named systems, in lieu of the progress charts specified above. The use of one of these methods shall be subject of the terms of clause entitled "Progress Charts and Requirements for Overtime Work" of the General Provisions.

19. METHODS AND SCHEDULES OF PROCEDURES: The work shall be executed in a manner and at such times that will cause the least practicable disturbance to the occupants of the buildings and normal activities of the station. Before starting any work, the sequence of operations and the methods of conducting the work shall have been approved by the OICC.

20. QUALIFICATION OF THE CONTRACTOR, SUBCONTRACTOR(S), AND/OR INDIVIDUAL EMPLOYEES THEREOF: The Contractor, subcontractors (if any), and/or individual employees performing work under this contract must be properly registered and/or licensed in accordance with applicable laws and regulations of the Government of Japan or its agencies, or any other cognizant governmental jurisdiction. If Contractor is a joint venture, all members of the joint venture must be licensed. Bids submitted by prospective prime contractors who are not so licensed and registered will be considered non-responsive. The prime Contractor will be held responsible for ensuring that subcontractors are so qualified, and failure to so ensure may result in withdrawal of such subcontractor's authorization to perform any work under the contract.

21. SUBCONTRACTORS AND PERSONNEL: Promptly after award of the contract, the Contractor shall submit to the OICC, in triplicate, a list of his subcontractors and the work each is to perform. The list shall include the names of the key personnel of the Contractor and sub-contractors, together with their home addresses and telephone numbers, for use in event of any emergency. From time to time as changes occur and additional information becomes available, the Contractor shall amplify, correct, and change the information contained in previous lists.

22. STORM PROTECTION: Should warnings of wind of gale force or stronger be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work, and to adjacent property. These precautions shall include closing all openings, removing all loose materials, tools and equipment from exposed locations, and removing or securing scaffolding and other temporary work.

23. COOPERATION WITH OTHER CONTRACTORS: Attention is invited to the fact that other Contractors may be engaged in similar and supporting

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work requiring close cooperation. The Contractor shall cooperate and schedule his work to avoid conflict with and interruption of the work of others insofar as practicable. In the case of conflicts with other Contractors that cannot be resolved satisfactorily, the matter shall be referred to the OICC for decision, and such decision shall be final, subject to right of appeal in accordance with terms of the contract.

24. CONTRACTOR'S FACILITY: If there is adequate land area available, and on the basis of non-interference in the requirements of the Government, the Contractor may be permitted to erect a structure of reasonable size at or near the site of the work. The Government is under no obligation to provide such land, but the OICC will accept a written request for temporary assignment of an area for such use. If approved, the Contractor may proceed, providing that it is clearly understood that the Government will bear no responsibility for the safety and security of the structure or its contents (including equipment, material or any other things of whatever nature). If the Contractor erects a structure on Government controlled land in accordance with the foregoing, it shall at all times be kept in a neat, clean, orderly condition in order to improve safety and reduce fire hazards. The disposal of trash and debris shall be the Contractor's responsibility. Electric power, water, and telephone may be installed in the structure, subject to approval of the Government, on payment by the Contractor of the established connection charges.

--END SECTION 1B---

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SECTION 1C. BIDS

1. INSTRUCTION TO BIDDERS: OICC Far East 4330/100 and Standard Form 19B, December 1965 edition, shall be observed in the preparation of bids. Envelopes containing bids must be sealed, marked, and addressed as follows:

Bids for " Officer in Charge of Construction
Specification No. 42-80-0277 Naval Facilities Engineering Command
Contracts, Far East, Box 61
FPO Seattle 98762

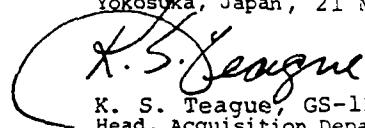
2. ITEM OF BIDS: Bids shall be submitted in duplicate on Standard Form 21, Bid Form, December 1965 edition, and Standard Form 19B, Representation and Certifications, December 1965 edition, and in accordance with Standard Form 20, January 1961 edition, and OICC Far East 4330/100 upon the following item:

Bid Item 1. Price for the entire work, complete in accordance with drawings and specifications.

3. REFERENCES TO AMENDMENT(S): Each bidder shall refer in his bid to all amendments to this specifications; failure to do so may constitute an informality in the bid.

4. BIDS shall be submitted on the basis of Japanese Yen.

Yokosuka, Japan, 21 March 1980



K. S. Teague, GS-12, Acting
Head, Acquisition Department
Officer in Charge of Construction
Naval Facilities Engineering Command
Contracts, Far East

Specification # 42-80-0277

WR # 02158

--END--

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SECTION 02110
DEMOLITION AND REMOVALS

1. GENERAL REQUIREMENTS: The work includes dismantling and removal of the existing degaussing range as indicated and as necessary.
2. EXISTING FACILITIES TO BE REMOVED:
 - 2.1 Magnetometers and Cables: These shall be dismantled and removed from the wood piles in the existing degaussing range.
 - 2.2 Wood Piles: Existing wood piles shall be cut-off at least one foot below mud-line.
3. USE OF EXPLOSIVES: Use of explosives will not be permitted.
4. DISPOSITION OF MATERIALS: All removed materials that are not to be reused shall be disposed of outside the limits of Government controlled lands at the Contractor's expense unless otherwise directed by the OICG.

END

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SECTION 02200
EARTHWORK

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by references thereto.

1.1 Japanese Industrial Standards (JIS):

A 1210-78 Density of soil in place by the sand cone method

2. GENERAL REQUIREMENTS: Bids shall be based on the following:

- (1) That the surface elevations are as indicated.
- (2) That no pipes or other artificial obstructions, except those indicated, will be encountered.
- (3) That hard material will not be encountered.
- (4) That water surface and pipe configurations indicated are approximate, the Contractor shall visit the site to confirm the field conditions.

In case the actual conditions differ substantially from those stated or shown, the provisions of the contract respecting and adjustment for changed conditions shall apply, subject to the requirements of notification thereunder being given. Hard material shall be defined as solid rock, firmly cemented unstratified masses or conglomerate deposits possessing the characteristics of solid rock not ordinarily removed without systematic drilling and blasting, and any boulder, masonry, or concrete except pavement exceeding 0.4 cubic meter in volume.

3. MATERIALS:

3.1 Soil Material: Soil material used as backfill indicated in the drawings shall be free from debris, roots, wood, scrap materials, vegetable matter, or refuse.

4. REQUIREMENTS:

4.1 Excavations: Excavations shall be carried to the contours and dimensions indicated or necessary. Excavations carried below the depths indicated, without specific directions, shall, except as otherwise specified, be refilled to the proper grade and compacted to at least 95

percent of JIS A 1210 density. All additional work of this nature shall be at the Contractor's expense. Soil disturbed and weakened by the Contractor's work or soils permitted to soften from exposure to weather shall be excavated and replaced with granular material compacted to 95 percent of JIS A 1210 density. All additional work of this nature shall be at the Contractor's expense.

4.1.1 Excavations for Structures: In excavations for concrete structures carried below the depths indicated without specific directions from the OICC, the concrete shall be extended to the bottom of the excavations; all additional work of this nature shall be at the Contractor's expense.

4.2 Filling and Backfilling:

4.2.1 Backfilling for Trenches: Backfill shall be placed in layers not more than 15 cm thick, and each layer shall be compacted properly.

5. DEWATERING:

5.1 Dewatering during Construction: Dewatering shall include the control of all forms of surface and subsurface water that may be encountered in the course of construction.

5.1.1 All excavation, construction and backfilling shall be performed under workably dry conditions. Prior to any excavation below ground water level the dewatering system shall be installed and placed into operation in order to lower the water levels at least 90 cm below the bottom and side slopes of the excavation.

5.1.2 The Dewatering System shall be operated continuously, 24 hours per day, 7 days per week until such time as all construction work below normal water levels is completed, unless notified to the contrary by the OICC, in which case the provisions of the contract respecting and adjustment for changes shall apply, subject to the requirements for notification thereunder being given.

5.1.3 After placement of initial slabs and backfill, the Water Level may be allowed to rise but at no time it is higher than 1 m below the prevailing level of excavation or backfill.

5.1.4 The Selection of Size and Spacing and Type of Dewatering Equipment shall be the responsibility of the Contractor, subject to the approval of the OICC.

5.1.5 Upon completion of the dewatering work the Contractors shall remove all equipment and leave the construction area in a neat, clean and acceptable condition.

END

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SECTION 02320
INSTRUMENTATION TUBE INSTALLATION

1. QUALITY CONTROL:

1.1 Testing or Certification of Materials: Test reports as stated herein or incorporated in referenced documents may be waived (except for specified field tests), provided three (3) copies of test reports from approved laboratories performed on previously manufactured materials are approved by the OICC. Test reports shall be accompanied by notarized certificates from manufacturer certifying that the previously tested material was the same type, quality and manufacture as that proposed for this project.

2. GENERAL: Instrumentation tubes shall be installed in the locations shown on the drawings.

2.1 Records: A complete and accurate record of each instrumentation tube installed shall be provided by the Contractor and shall be furnished to the OICC after completion of the work. The records shall include the following information for each tube:

- a. Plan location of the top of each tube;
- b. Elevation of the top of each tube referenced to Mean Lower Low Water;
- c. The angle of inclination with respect to the vertical of each tube.

2.2 Submittals on Installation Procedures: Before starting any work, the Contractor shall furnish to the OICC for his review and record purposes three (3) copies of a complete list of equipment, materials, design calculations, and drawings describing the Contractor's proposed instrumentation tube installation procedures. These submittals shall include, as a minimum: (a) the proposed method, list of equipment, hardware, personnel, materials and procedures the Contractor intends to use to survey and establish tube location; (b) the Contractor's proposed procedure and equipment for installation of the tubes; and (c) the Contractor's methods, equipment and procedures for the accurate recording of the installed tube plan locations, elevations and inclinations. The Contractor shall also furnish calculations, drawings, and manufacturer's literature necessary for the OICC to evaluate the accuracy of the survey method he intends to use.

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3. MATERIALS: The Government will furnish fiberglass-reinforced plastic pipes and fittings listed in Section 01011.

4. INSTALLATION

4.1 Handling: Instrumentation tube shall be handled and installed with care. Tubes found to be bent or kinked will not be allowed.

4.2 Pipe Splices: Splices may be used to increase the usable length of pipes. Preparation of splices shall be in accordance with the details shown in the drawings

4.3 Installation methods, equipment and procedures shall be the responsibility of the Contractor and shall be observed and approved by the OICC. The Contractor shall provide three (3) copies of the complete installation procedures that he intends to use to the OICC at least 21 days before installation begins. The Contractor is cautioned on the installation tolerance of the tubes. If after installation a tube does not meet the tolerances, as set forth hereinafter, the Contractor shall either remove and replace the tube or install a new tube at no expense to the Government.

4.4 Installation Tolerances:

4.4.1 The accuracy of the position of the top of each tube shall be within an allowable offset circle of maximum radius of 30 cm for the medium range instrumentation tubes (20 foot spacing) and 45 cm for the deep range instrumentation tubes (30 foot spacing). The center of the offset circles per tube corresponds to its respective location shown on the drawings. The offset of each tube shall not be cumulative along the range baseline as shown in the drawings.

4.4.2 All instrumentation tubes shall be installed vertically within a tolerance of 3 degrees.

5. FINAL TUBE LOCATION:

5.1 General: After installation, the Contractor shall establish the final plan location, elevation, and inclination of each tube so as to provide the Government with the information required under subparagraphs 2.1 "Records" above.

5.2 The method, equipment and procedures for establishing final tube location shall be the responsibility of the Contractor. The Contractor shall submit to the OICC three (3) copies of a complete list of equipment, hardware, personnel, material, and any special equipment that he plans to use for establishing final tube location.

END
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SECTION 03300
CAST IN PLACE CONCRETE

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto.

1.1 American Society for Testing and Materials (ASTM) Publications:

C 360-63 Ball penetration in fresh portland cement concrete

1.2 Japanese Agricultural Standard:

JAS No. 932 Plywood

1.3 Japanese Architectural Standard Specification:

JASS No. 5 Reinforced concrete work
JASS No. 6 Steelwork

1.4 Japanese Industrial Standards (JIS):

A 1101-75 Method of slump test for concrete
A 1108-76 Method of test for compressive strength of concrete
A 1132-76 Method of making and curing concrete specimen
A 5005-77 Crushed stone for concrete
G 3112-75 Steel bars for concrete reinforcement
K 6741-75 Unplasticized polyvinyl chloride (PVC) pipes
K 6743-77 Unplasticized polyvinyl chloride pipe fittings for water works services
R 5210-79 Portland cement
Z 3211-78 Covered electrodes for mild steel
Z 3801-79 Standard qualification procedure for welding technique

2. DELIVERY AND STORAGE:

2.1 Cement: Cement shall be stored immediately upon receipt. Cement in bags shall be stored in a suitable weather proof structure which shall be as air-tight as practicable; floors shall be elevated above the ground a distance sufficient to prevent the absorption of moisture. At the time of use all cement shall be free-flowing, and free of lumps.

2.2 Aggregates: Aggregates shall be stored on areas covered with tightly laid wood planks, sheet metal, or other hard and clean material.

2.3 Reinforcement: Reinforcement shall be stored in a manner that will avoid excessive rusting or coating with grease, oil, dirt, and other objectionable materials.

3. CONCRETE:

3.1 Construction: Concrete construction shall be in accordance with JASS No. 5 as modified herein. Concrete shall be Class E-1.

3.1.1 Proportion: Concrete shall be proportioned by volume or weight; and volume proportioned concrete shall conform to the following table. The compressive strength given is the 28-day ultimate. Volumetric measurement of aggregate shall be done using a unit box. The proportions are based on the assumption that the unit weight of the fine aggregate and coarse aggregate at the site will be 1377 kg/cubic meters and 1490 kg/cubic meters, respectively, and the moisture content will be three and one percent respectively. The cement factor shall be not less than that given.

210 kgf/sq. cm. concrete (Class E-1)

Portland cement	1 sack
Fine aggregate	0.072 cu.m.
Coarse aggregate	0.086 cu.m.
Water	24 liters

4. MATERIALS: Materials shall conform to the respective specification and standards and the requirements specified herein. Material not otherwise specified herein shall be approved standard commercial products and suitable for the intended purpose.

4.1 Cement: JIS R 5210, Class 1. All cement for exposed concrete surfaces shall be of the same manufacture.

4.2 PVC pipes and fittings: JIS K 6741, VP, and JIS K 6743.

4.3 Fine aggregate: JASS 5, Table Nos. 5.3.1 & 5.3.2, Class 1.

4.4 Coarse aggregate: JIS A 5005, size No. 2505 for concrete work.

4.5 Water: JASS 5.3.4.c.

4.6 Reinforcing bar: JIS G 3112, SD 30.

4.7 Cotton mats shall be free from any substance which may have a deleterious effect on fresh concrete.

4.8 Welding rods: JIS Z 3211, Class D4301 for mild steel.

5. FORMS:

5.1 General Requirements: Form shall be provided for all concrete not indicated or specified otherwise. Form shall be set true to line and grade and maintained so as to insure completed work within the allowable tolerances specified, and shall be mortar tight. The Contractor shall be responsible for the adequacy of forms and form supports. Bolts and rods used for internal ties shall be arranged so that when the forms are removed, all metal will be not less than 5 cm from any surface. All forms shall be constructed so that they can be removed without damaging the concrete.

5.2 Materials for Forms: Forms shall be of plywood, or steel. Plywood, shall be concrete-form plywood not less than 16 mm thick and shall conform with JAS 932, type I, free of raised grain, torn surfaces, worn edges, patches, or other surface defects which would impair the texture of the concrete surface. Surfaces of steel forms shall be free from irregularities, dents, and sags.

5.3 Coating: Before placing the concrete, the contact surfaces of forms shall be coated with a non-staining mineral oil or suitable non-staining form coating compound or shall be given two coats of nitro-cellulose lacquer, except as specified otherwise. All excess coating shall be removed by wiping with clothes.

6. PROPORTIONING, MEASUREMENT AND MIXING:

6.1 Proportioning of Materials: Proportioning of materials shall be accomplished by weight, except as otherwise provided herein. In urgent situations, volumetric proportioning may be used temporarily, if permitted by the OICC who will stipulate the length of the period during which volumetric proportioning may be used. The Contractor shall furnish the necessary equipment and shall establish accurate procedures for determining the quantities of free moisture in the aggregates, the true volume of the fine aggregate if volumetric proportioning is used, and the air content of the freshly mixed concrete if air-entrained concrete is used. Moisture, volumetric and air determinations shall be made at intervals as directed by the OICC as specified hereinafter under Sampling and Testing requirements. Allowable tolerances for measuring cement and water shall be 1 percent; and for aggregates 2 percent.

6.1.1 Weight Measurement: The fine aggregate and each size of coarse aggregate shall each be weighed separately. Cement in standard packages (bags) need not be weighed, but bulk cement or fractional packages shall be weighed on a scale separate from that used for weighing the other material.

6.1.2 Volumetric Measurement: The weight proportions shall be transposed into equivalent volumetric proportions by weighing representative samples of the aggregates in the condition in which they will be measured and in accordance with JIS A 1104. In determining the true volume of the fine aggregate, allowance shall be made for the bulking effect from the moisture contained therein. Suitable allowances shall also be made for variations in the moisture conditions of the aggregates.

6.2 Mixing: All concrete shall be machine mixed. In emergencies, the mixing may be done by hand if so authorized by the OICC. Mixing shall begin within 30 minutes after the cement has been added to the aggregates. The time of mixing after all cement and aggregates are in the mixer drum shall be not less than one minute for mixers having a capac-

ity of 0.77 cubic meter or less; for mixers of larger capacities, the minimum time shall be increased 15 seconds for each additional 0.77 cubic meter or fraction thereof of additional capacity. All mixing water shall be introduced in the drum before one-fourth of the mixing time has elapsed. The entire contents of the mixer drum shall be discharged before recharging. The time elapsing between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates and placing of the concrete in final position in the forms shall not exceed 60 minutes if the air temperature is less than 29 degrees C, and 35 minutes if the air temperature is equal or greater than 29.4 degrees C. The retempering of concrete, i.e., remixing with or without additional cement, aggregate, or water, will not be permitted.

6.3 Consistency of Concrete: Except as specified otherwise, the slump shall be from 5 cm to 10 cm and shall be determined in accordance with JIS A 1101. Consistency may be determined in the field by means of the ball-penetration method in accordance with ASTM C 360 after a correlation between slump and ball penetration is determined. Samples for slump determination shall be taken from the concrete during placing in the forms; samples for ball penetration shall be taken as specified in ASTM C 360.

7. PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS:

7.1 General Requirements: All reinforcement bars shall be provided as indicated or required by this specification, together with all necessary wire ties, chairs, spacers, supports, and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from rust, scale, oil, grease, clay and other coatings, and foreign substances that would reduce or destroy the bond. Rusting of reinforcement shall not be basis of rejection, provided that the rusting has not reduced the effective cross sectional area of the reinforcement to the extent that the strength is reduced beyond specified values. Heavy, thick rust or loose, flaky rust shall be removed by rubbing with burlap or other approved method, prior to placing. Reinforcement which has bends not shown on the project drawings or on approved shop drawings or is reduced in section by rusting such that its weight is not within permissible tolerances shall not be used. All reinforcement shall be supported and wired together to prevent displacement by construction loads or by the placing of concrete. Unless directed otherwise by the OICC reinforcement shall not be bent after being partially embedded in hardened concrete. Detailing of reinforcing shall conform to JASS 5.9. Where cover over reinforcing steel is not specified or indicated it shall be in accordance with JASS 5.10. The welding of reinforcement to the existing bulkhead steel sheet piling shall be in accordance with JASS 6.

8. PLACING CONCRETE:

8.2 Placing Concrete: No concrete shall be placed after there is evidence of initial set. Concrete placement will not be permitted when weather conditions prevent proper placement and consolidation. Sub-

grades of earth or other material shall be properly prepared and, if necessary, covered with heavy building paper or other suitable material to prevent the concrete from becoming contaminated. Forms shall be clean of dirt, construction debris, water, snow, and ice. Concrete shall be deposited in approximately horizontal layers 30 cm to 50 cm deep in a manner to preclude the formation of cold joints between successive layers. The placing of concrete below high-tide level, where practicable, shall be a continuous operation until the surface of the concrete has been brought above tide level. The method of depositing concrete shall be such as to avoid displacing the reinforcement and segregating the aggregate. Concrete shall be worked about the reinforcement and embedded fixtures and into corners and angles of the forms, care being taken to avoid overworking which may result in segregation.

8.2 Vibration: All concrete shall be compacted with high frequency, internal mechanical vibrating equipment supplemented by hand spading and tamping. Concrete slabs 10 cm or less in depth shall be consolidated by wood tampers, spading and settling with a heavy leveling straight edge. Vibrators shall be designed to operate with vibratory element submerged in the concrete, and shall have a frequency of not less than 6,000 impulses per minute when submerged. The vibrating equipment shall be adequate at all times in number of units and power of each unit to consolidate the concrete properly. Vibration shall be discontinued when the concrete has been compacted thoroughly and ceases to decrease in volume.

9. SURFACE FINISHES: All surface defects including tie holes, minor honeycombing and otherwise defective concrete shall be repaired with cement mortar. Cement mortar for patching shall be the same composition as that used in the concrete, except that for exposed surface part of the cement shall be white portland cement to provide a finish color matching the surrounding concrete. Patching shall be done as soon as the forms are removed. All areas to be patched shall be cleaned thoroughly. Minor honeycombed or otherwise defective areas shall be cut out to solid concrete to a depth of not less than 25 mm. The edges of the cut shall be perpendicular to the surface of the concrete. The area to be patched and at least 15 cm adjacent thereto shall be saturated with water before placing the mortar. The mortar shall be mixed approximately one hour before placing and shall be remixed occasionally during this period with a troweling without the addition of water. A grout of cement and water mixed to the consistency of paint shall then be brushed onto the surfaces to which the mortar is to be bonded. The mortar shall be compacted into place and screeded slightly higher than the surrounding surface. Patches shall be cured as specified for the concrete. Holes extending through the concrete shall be filled by means of a plunger type gun or other suitable device from the unexposed face. The excess mortar shall be wiped off the exposed face with a cloth. Concrete with excessive honeycombing, which exposes the reinforcing steel or other defects which affect the structural strength of the member,

shall be rejected or the defects corrected as directed by the OICC and at the expense of the Contractor. Concrete surfaces shall be steel trowel finished after repairs.

10. CURING: Finished surfaces shall be moist cured with wet mats as specified for not less than 7 days.

11. SAMPLING AND TESTING:

11.1 Conducting Testing: All testing shall be performed of the expense of the contractor by an independent testing laboratory by the OICC. All materials and identification of material sources shall be submitted to and approved by the OICC not less than 15 days prior to the use of such materials in the work.

11.2 Sampling:

11.2.1 Concrete: Three cylinders shall be molded. Test specimens shall be made in accordance with JIS A 1132. Concrete samples shall be of proper size to permit making the required test specimens.

11.3 Testing:

11.3.1 Concrete Testing:

11.3.1.1 Testing Consistency of Concrete Slump shall be determined in accordance with JASS A 1101. Consistency may be determined in the field by means of the ball-penetration method in accordance with ASTM C 360 after a correlation between slump and ball penetration is determined. Samples for slump determination will be taken from the concrete during placing in the forms; samples for ball penetration shall be taken as specified in ASTM C 360.

11.3.1.2 Compressive Tests: Testing of specimens for compressive strength shall be in accordance with JIS A 1108. Tests will be made at 7 and 28 days from time of molding. When a satisfactory relationship between 7-day and 28-day strengths has been established, the 7-day test results may be used as an indicator of the 28-day strength.

12. Steel work: Existing steel plate shall be replaced by welding new plate as specified in Section 16910 on the existing sheet piles. Welding shall be performed qualified welder by JIS requirements.

SECTION 16910
UNDERWATER ELECTRICAL WORK

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent required by the references thereto:

1.1 Japanese Industrial Standards (JIS):

A 5321-78	Reinforced concrete cable troughs
G 3101-76	Rolled steel for general structural
G 3191-66	Demension, weight and permissible variations of hot rolled steel bars and bar in coil
G 3193-77	Demension, weight and permissible variations of hot rolled steel plates, sheets and strips
K 5627-72	Zinc chromate anti-corrosive paint
K 5637-74	Deck paint

2. GENERAL REQUIREMENTS: The work includes placement of the magnetometer probes in the instrumentation tubes, attaching of the cable to the magnetometer probes, and laying and connecting to the cable to the shore station.

3. MATERIALS:

3.1 The Government will furnish magnetometer probes, instrumentation tube and attaching fixtures, cables, as listed in Section 01011.

3.2 Steel bars and plate for manhole cover: JIS G 3101, Class 2, G 3191 and G 3193.

3.3 Primer: JIS K 5627.

3.4 Finish paint: JIS K 5637.

3.5 Concrete troughs: JIS A 5321.

4. MAGNETOMETER PROBE INSTALLATION:

4.1 Magnetometer probes shall be placed inside the instrumentation tubes as shown in the drawings.

4.2 The accuracy of the depth placement of the magnetometer probes shall be within \pm 37.6 cm for the medium range array (60 foot depth) and \pm 48.8 cm for the deep range array (80 foot depth).

5. UNDERWATER CABLE LAYING:

5.1 Cable shall be placed from the range house to each magnetometer probe. Cable shall not be field spliced.

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5.2 The shore portion of the cable route shall utilize the existing trough from the range house to the seawall bulkhead. Cables shall pass through the seawall bulkhead via an existing 90° steel elbow. Prior to placing cable, the interior of the cable trough shall be cleaned thoroughly. All debris shall be removed from the cable route.

5.3 From the junction of the seawall bulkhead to Station 1+00 (100 foot spacing), the cable shall be protected by using PVC pipes and concrete troughs. The troughs shall be buried as indicated in the drawings.

5.4 The cable which runs up the instrumentation tube to the probe shall be attached to the tube with cable ties as shown in the drawings.

c. Metal Manhole Covers: Covers shall be of the steel, and sizes are as indicated. Surfaces shall be painted as specified hereinafter. Pulling-in handle shall be of galvanized steel bars, approximately 100x200 mm.

6.1 Painting: Metal Cover Surfaces shall be primed with one coat of zinc-chromate primer conforming to JIS K 5627, and finish with two coats of deck paint conforming to JIS K 5637.

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